

In situ observation of the behavior and growth of NaCl crystal
— under ground and micro gravity —

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Recently, crystal has a lot of demands as functional materials. Therefore the rigid control of purity and size distribution of product crystals is required. However, the control method of both objects is not yet established, because the crystallization, especially nucleation, is very complicated phenomena. The aim of this work is to clarify the nucleation phenomena, behavior of nuclei, the surface conditions of seed materials and the liquid structure of the near the seed materials by the in situ observation of the optical microscope and the light scattering system using by the micro-gravity condition. These results will be help to make clear of nucleation and crystal growth mechanisms.

The apparatus consists of crystal growth cell, light scattering counting and optical observation. The cell consist of two parts which are holded the seed crystals and filled with the supersaturated solution. At first, The sample solution, of which the temperature was holded over 10°C of saturation temperature, was poured into the cell and then cooled at a fixed crystallization temperature. Then, the base of holder part of the cell was opened and the seed crystals were fallled into the solution. From this time, the nucleation and crystal growth phenomena were observed and recorded by above measurement instruments up to the end of microgravity conditions.

Under the micro gravity in this work, it is found that the produced secondary nuclei stopped the moving and not agglomerated each other. And the new nucleation did not took place, but the nuclei produced grew. Also the change of number and size of these nuclei could be measured by the optical observation and the light scattering counting instruments of this work under the microgravity. From this, it may be intend to the quantitatively evaluation of the results of light scattering counting and optical observation of the structure of interface of liquid and crystal for elucidate of crystallization mechanism under microgravity with long time, i.e., TR-1A rocket.